This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A method of evaluating the abruptness of a junction in a semiconductor sample, the method comprising:

directing an intensity modulated pump beam and a probe beam on the sample surface;

obtaining two or more measurements by analyzing the reflected probe beam, each measurement composed of an in-phase (I) value and a quadrature (Q) value where at least one measurement is obtained after changing the relative position of the pump and probe beams on the sample surface; [[and]]

~~deriving an abruptness value for the junction as a function of the I and Q values included in the measurements~~.

deriving the slope of a line in the I-Q plane fitted to the I and Q values that compose the measurements; and

comparing the derived slope with previously derived slopes associated with calibration samples having a known junction abruptness to derive an abruptness value for the measured sample.

Claim 2. (cancelled)

3. (original) A method as recited in claim 1, wherein one of the measurements is obtained when the pump and probe beams are overlapping.

4. (original) A method as recited in claim 1, where the I and Q value are compared to I and Q values obtained from one or more calibration samples having known junction abruptness values.

5. (currently amended) A method of evaluating the abruptness of a junction in a semiconductor sample comprising:

directing an intensity modulated pump beam to a spot on the sample to periodically excite a region of the sample;

directing a probe beam to a first measurement spot within the periodically excited region of the sample;

monitoring the reflected probe beam and generating first output signals;

directing the probe beam to a second measurement spot within the periodically excited region of the sample, said second measurement spot being spaced from the first measurement spot;

monitoring the reflected probe beam and generating second output signals; and

filtering and processing the output signals to create in-phase (I) and quadrature (Q) components and analyzing the I and Q components derived from the two different measurement spots to determine the abruptness of the junction, wherein the processing includes analyzing the slope of a line fit to the I and Q components derived from the measurement points as plotted in I and Q space.

6. (original) A method as recited in claim 5, wherein one of the measurement spots is coincident with the pump beam spot.

Claim 7. (cancelled)

8. (currently amended) A method of evaluating the abruptness of a junction in a semiconductor sample, the method comprising:

focusing an intensity modulated pump beam and a probe beam on the sample surface;

obtaining two or more measurements by analyzing the reflected probe beam, each measurement composed of an in-phase (I) value and a quadrature (Q) value where each at least one measurement is obtained after changing the power density of the pump beam on the sample surface; ~~and~~

~~deriving an abruptness value for the junction as a function of the I and Q values included in the measurements~~

deriving the slope of a line in the I-Q plane fitted to the I and Q values that compose the measurements; and

comparing the derived slope with previously derived slopes associated with calibration samples having a known junction abruptness to derive an abruptness value for the measured sample

Claim 9. (cancelled)

10. (original) A method as recited in claim 8, wherein the power density of the pump beam is changed by changing the spot size of the pump beam on the sample.

11. (original) A method as recited in claim 8, wherein the power density of the pump beam is changed passing the pump beam through a filter.

12. (currently amended) A method of evaluating the abruptness of a junction in a semiconductor sample comprising:

directing an intensity modulated pump beam to a spot on the sample to periodically excite a region of the sample;

directing a probe beam to a measurement spot within the periodically excited region of the sample;

monitoring the reflected probe beam and generating first output signals;

changing the power density of the pump beam;

monitoring the reflected probe beam and generating second output signals; and

filtering and processing the output signals to create in-phase (I) and quadrature (Q) components and analyzing the I and Q components derived from the two different power densities to determine the abruptness of the junction wherein the processing includes analyzing the shape of a line fit to the I and Q components derived from the measurement points as plotted in I and Q space.

Claim 13. (cancelled)

14. (original) A method as recited in claim 12, wherein the power density of the pump beam is changed by changing the cross-sectional size of the pump beam.

15. (original) A method as recited in claim 12, wherein the power density of the pump beam is changed passing the pump beam through a filter.

Claims 16- 17. (cancelled)

18. (currently amended) A method of characterizing a semiconductor sample, the method comprising:

directing an intensity modulated pump beam and a probe beam on the sample surface;

obtaining two or more measurements by analyzing the reflected probe beam, where one measurement follows the previous measurements after a predetermined period of time;

fitting the ~~resulting~~ measurements to a curve by using a function with two or more variables; and

characterizing the incompleteness of an annealing process and/or the presence of surface states by evaluating the [[delay]] curve.

19. (currently amended) A method as recited in claim 18, in which [[the]] a change in the function is calculated as the value of the ~~exponential~~ curve sampled at an initial time divided by the value of the ~~exponential~~ curve sampled at a time corresponding to the predetermined time period.

20. (currently amended) A method of evaluating two or more properties of a junction formed in a semiconductor sample, the method comprising:

directing an intensity-modulated pump beam and a nonmodulated probe beam on the surface of a sample;

~~analyzing~~ determining the in-phase (I) and quadrature (Q) components of the reflected probe beam intensity; [[and]]

~~deriving two or more properties of the junction based on the measured Q and I components~~.

deriving the slope of a line in the I-Q plane fitted to the determined I and Q components; and

using the derived slope in combination with a previously derived slope associated with a calibration sample having a known junction abruptness to derive two or more properties of the junction.

Claim 21. (cancelled)

22. (new) A method of evaluating the incompleteness of an annealing process and/or the presence of surface states of a semiconductor sample, the method comprising:

directing an intensity modulated pump beam to the surface of the sample to periodically excite a region on the sample;

directing a probe beam to a spot within the periodically excited region;

obtaining a first measurement of the modulated changes in the reflected intensity of the probe beam induced by the periodic excitation;

continuing to periodically excite the sample for a predetermined time period;

obtaining a second measurement of the modulated changes in the reflected intensity of the probe beam induced by the periodic excitation;

calculating a decay factor based on the first and second measurements; and

using the decay factor to evaluate the incompleteness of an annealing process and/or the presence of surface states of a semiconductor sample.

23. (new) A method as recited in claim 1, wherein said decay factor is calculated by dividing the results of the second measurement by the results of the first measurement.